

IN THE CLAIMS

- 1 (Withdrawn). A method comprising:
 forming a stack including at least two cooling integrated circuit chips
sandwiching a heat generating integrated circuit chip, said cooling integrated circuit chips
including microchannels for the circulation of a cooling fluid; and
 securing a second heat generating integrated circuit chip on one of said cooling
chips.
- 2 (Withdrawn). The method of claim 1 including forming electroosmotic pumps in
said integrated circuit cooling chips.
- 3 (Withdrawn). The method of claim 1 including forming re-combiners integrated
in said cooling integrated circuit chips.
- 4 (Withdrawn). The method of claim 1 including sealing the edges of said stack
except for ports to access said microchannels.
- 5 (Withdrawn). The method of claim 4 including providing a fluid inlet reservoir
and a fluid outlet reservoir in communication with said microchannels.
- 6 (Withdrawn). The method of claim 5 including forming said reservoirs in a
package including said stack.
- 7 (Withdrawn). The method of claim 6 including isolating said inlet and outlet
reservoirs in said package.
- 8 (Withdrawn). The method of claim 7 including coupling said inlet and outlet
reservoirs exteriorly of said package.

9 (Withdrawn). The method of claim 1 including providing electrical connections between said cooling integrated circuit chips and said heat generating integrated circuit chips.

10 (Withdrawn). The method of claim 9 including using vias to provide said electrical connections.

11 (Original). A packaged integrated circuit structure comprising:
a pair of integrated circuit chips;
a cooling integrated circuit chip between said pair of integrated circuit chips, said cooling integrated circuit chip including microchannels for the circulation of a cooling fluid; and
a package containing said integrated circuit chips.

12 (Original). The structure of claim 11 including a first trench for containing a fluid so as to communicate from the exterior of said cooling integrated circuit chip with said channels.

13 (Original). The structure of claim 12 including a second trench isolated from said first trench and abutting said cooling integrated circuit chip in said package.

14 (Original). The structure of claim 13 wherein said second trench to contain fluid and to fluidically communicate with said microchannels.

15 (Original). The structure of claim 14 including ports to communicate with said first trench and said second trench from the exterior of said package.

16 (Original). The structure of claim 11 including an integrated electroosmotic pump in said integrated circuit cooling chip.

17 (Original). The structure of claim 11 including integrated re-combiners in said cooling integrated circuit chip.

18 (Original). The structure of claim 11 wherein the edges of said heat generating integrated circuit chips are sealed.

19 (Original). The structure of claim 15 wherein said ports are connected exteriorly of said package.

20 (Original). The structure of claim 11 including electrical vias coupling said integrated circuit chips.

21 (Original). The structure of claim 11 including a controller, electroosmotic pumps, and temperature sensors within said integrated circuit chips to selectively operate said electroosmotic pumps to cool particular regions of said heat generating integrated circuit chips.

22 (Original). A packaged integrated circuit structure comprising:
a stack including a pair of integrated circuit chips and a cooling integrated circuit chip between said pair of integrated circuit chips, said cooling integrated circuit chip including microchannels for the circulation of a cooling fluid;
a package receiving said stack, said package having formed therein an inlet fluid reservoir and an outlet fluid reservoir to communicate with said microchannels; and
a path to recycle fluid from said outlet fluid reservoir to said inlet fluid reservoir.

23 (Original). The structure of claim 22 including a second cooling integrated circuit chip on one of said integrated circuit chips.

24 (Original). The structure of claim 22 including a path on the exterior of said package.

25 (Original). The structure of claim 22 wherein the edges of said integrated circuit chips are sealed.

26 (Original). The structure of claim 22 wherein said stack is in contact with said fluid reservoirs.

27 (Original). The structure of claim 26 wherein said microchannels communicate with the edges of said cooling integrated circuit chip.

28 (Original). The structure of claim 22 including electroosmotic pumps in said cooling integrated circuit chip.

29 (Original). The structure of claim 28 including a re-combiner coupled to each of said electroosmotic pumps.

30 (Original). The structure of claim 27 wherein said cooling electroosmotic pumps may be selectively operated to provide localized cooling.

31 (Original). The structure of claim 22 including a plurality of temperature sensors to enable temperature controlled cooling.